NOTES ON WEATHER IN OTHER PARTS OF THE WORLD.

Atlantic Ocean.—On December 31, the International Mercantile Marine Co. announced a change in the trans-Atlantic steamship routes on account of ice recently reported in low latitudes. The alteration, which ordinarily takes place in February, was to become effective immediately.[1]

Iceland.—The mild winter has caused a failure of the usual local supply of ice needed for preserving herring. * * *—*The Pathfinder, Jan. 29, 1921.*

British Isles.—In all parts of the British Isles the abnormally mild weather which set in just before Christmas was continued nearly throughout the whole of January.

The general rainfall for the countries expressed as a percentage of the average were England and Wales, 146; Scotland, 168; Ireland, 119. * * *

In London (Camden Square) the mean temperature was 46° F., or 7.3° above the average. Only two days (15th and 16th) had a mean temperature below the January average, and five days had a mean above 50° F. Since 1858 only one December, no Januaries, no Februaries, and five Marches have had a higher mean temperature.[1]

Western Europe.—* * * Over a large part of western Europe mild, stormy, and unsettled weather with southwesterly winds, alternated with briefer spells of the finer, colder weather occurring in the rear of the depressions and their secondaries.[1]

Northern Europe.—In northern Europe the weather was, for the most part, cold, and severe frosts were experienced at some of the stations in Norway and Sweden.[1]

Italy.—In Italy and the central part of the Mediterranean fair weather prevailed, except in the middle of the month, when a depression in that region caused an unsettled period.[1]

India.—January 13.—Famine is officially declared to exist in one of the districts of India, while there is a food scarcity in many other districts as the result of lack of winter rains for the crops. * * * —*Washington Star, January 13, 1921.*

During the week ending January 22, * * * light to heavy rain was general in the northeastern and central parts of the country and parts of Madras. While this fall was of considerable benefit more rain is needed in the majority of the provinces.[1]

Hawaii.—Honolulu, January 17.—Storms which struck the Hawaiian Islands Saturday and yesterday (Jan. 15–16) expended greatest violence on the island of Kauai, according to advices received here to-night. * * *

One district of Honolulu County reported 20 inches of rain fell Saturday night and Sunday. * * *

The Oahu railroad services were disorganized by washouts. The highway system was blocked by many slides and washouts.—*Washington Star, January 18, 1921.*

Australia.—At the beginning of the month heavy general rain occurred in Victoria and fairly heavy falls in the Riverina district in New South Wales. Isolated rainfalls were experienced in northern New South Wales and in South Queensland. Beneficial rain fell throughout New Zealand during the month.[1]

[1] *The Meteorological Magazine*, February, 1921, pp. 23 and 28.

[1] *The Meteorological Magazine*, February, 1921, pp. 23 and 28.

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DETAILS OF THE WEATHER OF THE UNITED STATES.

CYCLONES AND ANTICYCLONES.

By W. P. DAY, Observer.

The majority of the LOWS passed along the northern border of the United States, making their first appearance over the North Pacific or Alberta with a few secondary developments over the southern plateau.

The number of HIGHS was slightly above the normal and they generally originated over the Pacific Ocean. However, the great HIGH of January 16–21 was of the Alberta type.

The table below gives the number of HIGHS and LOWS by types:

Lows.	Alberta.	North Pacific.	South Pacific.	Northern Rocky Mountain.	Colorado.	Texas.	East Gulf.	South Atlantic.	Central.	Total.
January, 1921....	5.0	4.0	1.0	.....	3.0	.....	1.0	.....	.....	14.0
Average number, 1892–1912.....	4.7	2.5	0.9	0.4	1.4	1.5	0.4	0.4	0.5	12.7

Highs.	North Pacific.	South Pacific.	Alberta.	Plateau and Rocky Mountain region.	Hudson Bay.	Total.
January, 1921.....	2.0	4.0	3.0	3.0	1.0	13.0
Average number, 1892–1912.....	0.8	0.6	5.5	1.7	0.4	9.0

THE WEATHER ELEMENTS.

By P. C. DAY, Climatologist and Chief of Division.

[Weather Bureau, Washington, Mar. 2, 1921.]

PRESSURE AND WINDS.

The distribution of atmospheric pressure during the month was materially different from that usual to midwinter, and illustrates how profoundly small variations may alter the normal courses of cyclones and anticyclones over particular regions. Continued low pressure in the far Northwest and generally over the western Canadian Provinces, was unfavorable for the southward movement of anticyclones into the western United States, and pressure higher than normal over the Central and Southeastern States resisted the usual southeastward trend of storms entering the country from the North Pacific regions. Although the month was unusually stormy over the far Northwest, few of the low-pressure areas crossed the mountains with material strength, and storms of wide extent or of considerable severity were notably absent over the districts from the Rocky Mountains eastward.

The high-pressure areas developed mainly in the plateau regions and drifted thence eastward or southeastward and thus maintained pressure above normal in all central and southern districts. The principal exception to this was during the latter part of the second decade, when a high area of wide extent entered the Missouri Valley from the Canadian Northwest and slowly moved

eastward along the northern border. Its influence was felt, however, over all districts from the Rocky Mountains eastward and some of the highest barometer readings ever observed were reported at a number of stations from the Great Lakes southeastward to the middle Atlantic coast.

The stormy conditions in the far Northwest continued throughout the month and near the close, one of the severest wind storms ever experienced in that part of the country swept the coast districts of Oregon and Washington, causing almost incalculable damage to the standing timber in portions of the most extensive and heavily forested area in the United States. A partial report on the extent of, and damage from, this storm appears in another portion of this REVIEW.

For the month as a whole, pressure was low over the Northwest and in the adjoining Canadian Provinces, and high over the remaining districts, particularly so in the more southern districts. In the absence of marked pressure variations, wind velocities were usually moderate and high winds were the exception, save in a few instances.

The principal sections with winds of 50 miles or more per hour, were along the North Atlantic coast on the 17th and 20th, in the region of the Great Lakes and to the westward on the 15th and 16th, and over the North Pacific coast on the 29th.

The frequent occurrences of high pressure over southern districts favored winds from southerly quadrants penetrating far to the northward of their usual limits, and their influence on the weather of the month is graphically shown on Chart IV of this REVIEW.

TEMPERATURE.

Mild weather prevailed during the early part of the month over all sections, except in the far Southwest, where moderately low temperatures were the rule. Shortly after the middle of the first decade considerably cooler weather overspread the East and Southeast but this was quickly followed by higher temperatures, while cooler weather overspread the Rocky Mountain section, with temperatures below zero in some localities. There was a general tendency to lower temperatures at the close of this decade, although they remained mostly near the seasonal average. After a few days of moderate temperatures, the coldest weather of the month overspread most sections east of the Great Plains, and killing frosts were reported in northern Florida and heavy frost to the central portion of the peninsula. During the third decade the temperatures were above the normal almost everywhere except in the Atlantic Coast States, along the northern border, and on the Pacific slope.

For the month as a whole, the temperature averaged above the normal in all districts, except locally in the far Southwest and along the immediate Pacific coast. The plus departures ranged from 4 to 9 degrees a day in nearly all Southern States, and also from the Ohio Valley and Lake region eastward. In the upper Mississippi Valley and the central and northern Great Plains the temperature averaged from 9 to 16 degrees a day above normal, while in the Rocky Mountain and plateau regions the averages ranged from 4 to 6 degrees above.

The month may be classed among the warmest of record for midwinter over many portions of the country, and at a few points, notably in the Missouri and upper Mississippi Valleys, it was the warmest in the past fifty years or more. No portion of the month was markedly warmer than other portions over large areas, and the maximum temperatures were observed on many different dates for the various sections. The lowest temperatures were confined largely to the middle decade and very generally during the early part. A minimum of −40° F., the lowest observed, was reported from a point in Wyoming, and temperatures of −30° F. or more were reported from several of the mountain States, also along the northern border and in the elevated portions of New York and New England.

PRECIPITATION.

Precipitation was of moderate frequency over most districts, and as a rule the falls were mainly light, except for fairly heavy rains over the southeastern States on the 9th and 10th; from the west Gulf States northeastward and eastward on the 13th to 15th; on the Pacific coast about the 17th and 18th; over the southern plains on the 23d and 24th; and again on the Pacific coast on the 29th and 30th.

For the month as a whole, precipitation was less than normal over large portions of the country and, save for small areas in the southern Appalachian region, the entire country from the Mississippi Valley eastward had far less than the normal for the month. In the vicinity of the Great Lakes the precipitation was decidedly scanty for a winter month, some stations reporting the monthly fall as being the least for January in a period of 50 years, due mainly to the small snowfall. In the southern Plains, the precipitation was generally greater than usual for January, and similar conditions prevailed in California and Oregon and over portions of the plateau.

SNOWFALL.

The early part of the month was remarkably free from stormy conditions usually expected in the midwinter period, and such snow as fell was largely local. However, toward the latter part of the first decade, some unusually heavy falls occurred in the mountain districts of Virginia and North Carolina. Some snow also fell over considerable areas in the western mountain districts and locally in New England. Throughout the second decade the snowfalls were mostly light, except in the vicinity of Lake Superior, where some heavy falls occurred. Deep snows fell during the early part of the third decade in portions of the mountain districts of California, and light falls were general in the other mountain sections as far east as the central portions of the plateau region and also in portions of the Lake region, New England, the Ohio Valley, and the southern Appalachian region.

In portions of the Carolinas and Virginia the snowfall for the month appears to have been the heaviest of recent years, some localities receiving during the month over 30 inches. In the high mountains of the West there were material increases over important areas in the snow depth, particularly in the mountains of California, Oregon, and Washington, and portions of Idaho and Nevada. Compared with the same period last year, there was much less snow over all sections from the Rocky Mountains eastward, but in the mountains of the West there was generally more.

At the close of the month the amounts of snow stored in many of the western mountains were close to or above the normal, and the outlook for a satisfactory supply of water next summer was good.

RELATIVE HUMIDITY.

In the southern portion of New England, the coastal portion of the central and western Gulf States, the cen-

tral and northern Great Plains, and the far Southwest, the relative humidity was as a rule above the seasonal average, while generally elsewhere there was relatively less moisture in the atmosphere than is usual for January, although in many instances excesses occurred. This was notably the case in portions of the central and upper Mississippi Valley and the Lake region, where despite the small amount of rainfall the relative humidity averaged above the normal.

SEVERE STORMS.

The most important storm of the month, in fact probably the only one causing material property damage on account of high winds, occurred over the immediate coast districts of Oregon and Washington on the afternoon of the 29th. This storm occurred in connection with a low pressure area that appears to have been approaching the northwest coast of Washington from the adjacent ocean.

At the morning observation of the 29th, pressure was low and falling, as indicated by the few reports received from that section, but the rate of fall did not suggest unusual conditions, as this is a region of great storm activity during the winter months and high winds are of frequent occurrence, particularly near the coast. The pressure continued to fall after the morning observation, and by early afternoon it was quite low along the entire coast from the mouth of the Columbia River northward to British Columbia.

At the North Head station located on the Washington side, at the mouth of the Columbia River, the lowest pressure was reached at about 3:30 p. m. Prior to about 3:20 p. m. the wind had not attained a velocity greater than 40 miles per hour, but within a few minutes, the wind suddenly increased greatly in force and by 3:32 p. m. had reached a velocity of 126 miles per hour based upon a five-minute record, with an extreme velocity for a single minute at the rate of 150 miles per hour.

A further description of the storm can best be expressed in the words of the Weather Bureau observer at that station, which are extracted from his official report.

At 8 a. m. on January 29, 1921, small craft warnings were displayed as ordered by the district forecaster. At 11:40 a. m., local time, a special observation was taken and sent to the district forecaster. At this observation the sea-level pressure was 29.43 inches. The two-hour pressure change was −0.16 inch. Wind east 24 miles per hour. The barometer continued to fall rapidly until about 2 p. m. when it seemed that the center of the low had been reached and fell very slowly. Near 2:30 p. m., as no orders had been received to change the warnings and the barometer had almost stopped falling, I concluded that the storm was similar to the one of January 16 and 17. We were in need of some supplies and the mail from Ilwaco. By using the car it requires about one hour to make the trip to the post office and return. At 2:40 p. m., Mrs. Hill and I left the office. After getting the mail from the post office and a few articles from the stores in Ilwaco we started for home, but the extreme low air pressure probably affected the motor of the machine and a short delay from this cause probably saved our lives.

The road from Ilwaco to North Head is through a heavy forest of spruce and hemlock timber for some distance. On the return trip shortly before reaching the heavy timber, the wind came with quite a heavy gust. We saw the top of a rotted tree break off and fall out of sight in the brush. About this time (near 3:20 p. m.) we were overtaken by a young man from the naval radio station at North Head who was driving a car. It is dangerous driving over this road under favorable conditions. We proceeded very slowly and with great care, passing over some large limbs that had fallen and through showers of spruce and hemlock twigs and small limbs blown from the trees. We soon came to a telephone pole across the roadway and brought our car to a stop, for a short distance beyond the pole an immense spruce tree lay across the road. We left the machines and started to run down the road toward a space in the forest where the timber was lighter. Just after leaving the car, I chanced to look up and saw a limb sailing through the air toward us; I caught Mrs. Hill by the hand and we ran; an instant later the limb, which was about 12 inches in diameter, crashed where we had stood. In three or four minutes we had climbed over two immense tree trunks and reached the place in which I thought was our only chance to escape serious injury or possibly death. The southeast wind roared through the forest, the falling trees crashed to the ground in every direction from where we stood. Many were broken off where their diameter was as much as 4 feet. A giant spruce fell across the roadway burying itself through the planks within 10 feet of where we stood. Tree tops broke off and sailed through the air, some of the trees fell with a crash, others toppled over slowly as their roots were torn from the earth. In a few minutes there were but two trees left standing that were dangerous to us and we watched every movement of their large trunks and comparatively small tops.

Between 3:45 p. m. and 3:50 p. m. the wind shifted to the south and the velocity decreased to probably 100 miles or it may have been as low as 90 miles per hour. Shortly after 3:50 p. m. we started toward North Head. We climbed over some of the fallen trunks, crawled under others, and pushed our way through tangled masses of tops that lined the roadway. We supposed that all the houses at North Head had been leveled and the wireless station demolished for we knew that the storm was the most severe that had occurred in the vicinity of the mouth of the Columbia within the last 200 years. Mr. Seui, the young man from the radio station who was with us, hastened through the obstructions, and Mrs. Hill and I proceeded more slowly. About one-fourth of a mile from the station we were met by one of the men from the radio station, who had come to assist us had it been necessary. At 4:40 p. m. we arrived at the assistant lightkeeper's home where all the families of the Head had gathered for safety.

Such reports as are at hand indicate that while the low-pressure area was advancing from the Northwest, the high easterly or southeasterly winds attending the approach of the storm to the Washington coast moved northward along the coast, as a vessel report from off the Oregon coast, a considerable distance south of the North Head station, indicates that the lowest pressure and highest winds occurred several hours earlier than at the North Head station, in fact, at Point Reyes Light on the middle California coast, high winds occurred early in the forenoon.

At Tatoosh Island about 150 miles north of the mouth of the Columbia River, the lowest pressure and maximum wind velocity, 110 miles per hour, occurred about 7 p. m., several hours later than at North Head.

The recorded wind velocities at the North Head and Tatoosh Island stations were the highest ever observed at the respective stations, and judging from the damage to the forests of that region, are probably the highest that have occurred in the period covered by the growth of the oldest trees.

While the extent of the storm at the present time is uncertain, it appears that the entire coast district, probably from central Oregon to the Straits of Juan de Fuca, a distance of 200 miles or more, was swept by winds of hurricane velocity. How far inland these destructive winds extended is unknown at the present, but it seems probable they were limited to the western slopes of the mountains that follow the coast line a comparatively short distance therefrom.

Reports from Forest Service officials, who are in touch with conditions in the national forests in that locality, indicate that the damage to standing timber is the greatest ever experienced in the country. Billions of feet of the finest timber in the United States were uprooted or otherwise thrown down, much of which will be a total loss as it lies in regions not readily accessible for salvage.

Despite the severity of the winds, few lives are known to have been lost, and damage to property consisted mainly in the loss of timber.

Later reports, particularly from the cooperative observers of the bureau, located in the territory covered by the storm, will probably more fully outline its extent and comparative severity. Important facts covering these items will appear in a later REVIEW.